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Integrated Service Technical Application - Programming (ISTA/P)

Model: All Models

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Navigate through the various ISTA/P menus
- Successfully code/program a BMW Group Vehicle
- Understand the reports generated by ISTA/P
- Know how to import a VO
- Know how to import an enabling code
- Know how to update the Navigation maps
- Know how to update the Gracenote® DB

Introduction

Reasons for introduction of the new programming system

Due to the constantly growing complexity and ongoing development of functions over the life of vehicles, adaptation of the software on the control units is unavoidable.

The launch of the F01 brought with it a new generation of vehicles which have not only new functions but also a new control unit architecture and a new electrical system configuration.

In order to ensure that those technologies can be supported by the dealer organization today and in the future, a new workshop system was introduced alongside them.

The new workshop system incorporates an extensive workshop network with a central server for data storage and provision of the applications. It also introduces new hardware components for diagnosis and programming.

The existing programming system, Progman, is being replaced by the Integrated Service Technical Application for Programming, ISTA/P.

ISTA/P contains the present vehicle field programming functions plus new functions and is thus designed for the future content and requirements of vehicle programming in the field.

Note: For more information regarding ISTA/P, please refer to Dealernet and select: Menu>BMW>Aftersales Portal>Service>Workshop Technology and access the ISTA/P User Documentation file. You can also type Workshop Technology in the search engine and that will prompt you to the correct web page.

New features when comparing ISTA/P with Progman

- Reduction and combination of input demands.
- Configurable measures plan viewable as a graphical chart or a table.
- Detailed display of control unit status.
- Automatic repetition of programming in the event of control unit programming or coding errors within the programming process.
- Importing of enabling codes/vehicle order from any location in the workshop provided there is access to the workshop system/ISTA/P.
- Measures plan can be subsequently extended and adapted.
- Programming takes place first followed by automatic coding of all control units.
- Proactive saving of customization and CBS data and re-importing into control units from F01 on.
- Saving of personal profile settings such as phone book or navigation destinations, depending on control units fitted.
- Generation of a control unit order list if hardware needs to be replaced.
- Session can be saved if parts are not immediately available.
- Display of the Progman or ISTA/P version that was last used to program the vehicle.
- Timely/faster updates.

Release Phases

The new programming system ISTA/P is to be introduced in several phases.

Phase 1

Phase 1 requires the transformation of the Software Service Station, SSS, into the Integrated Software Service Station, ISSS. This “Phase 1”, allows the ISSS to be integrated in the ISIS network.

The actual data/software (ISTA/P application) needed to program the vehicles is installed in the will be on the ISSS. Updates will be applied to the ISIS via Jetstream or from DVD and then passed on to the ISSS during the maintenance cycles (off-business hours).

ISTA/P is capable of programming and coding all models.

Initially, the interface and control for programming can only take place by using keyboard and mouse on the ISSS. Soon after, programming control can take place via each individual ISID in the workshop.

The ICOM A and the ICOM B will be used as vehicle interface for programming. The ICOM B will be used exclusively for programming MOST control units.

From the introduction of the ethernet connection in the OBD2 interface, ICOM B will not be used. (example: F01/F02)



Illustration of Phase 1

Future Phases

It is planned to integrate the programming system ISTA/P entirely in the ISIS workshop server. A precise timetable for integration of ISTA/P in ISIS has not yet been established.

Transforming an SSS into an ISSS

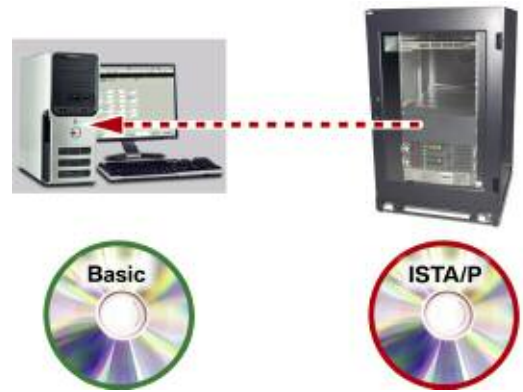
The technical requirements for conversion demand that the SSS is at least the 2nd generation (release 2). The 1st generation SSS can not be converted.

A starter pack containing the following items will be needed:

- ISSS - basic DVD (1 disc)
- ISIS - ISTA/P client (1 disc)
- ISIS ISTA/P data/software (2 disc)

First, the basic DVD is placed in the DVD drive on the SSS and the operating system installed on the SSS. In the process, the previous application, Progman, is completely deleted. From this point on, future, updates and installation of the ISTA/P application on the ISSS will take place exclusively via the ISIS.

The ISTA/P client and then application software are installed on the ISIS. The ISSS is updated/supplied with the application software by the ISIS via the network during the maintenance cycle.








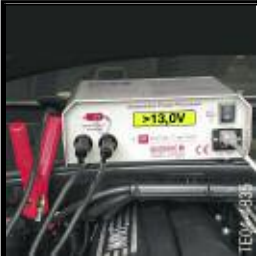

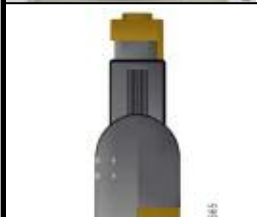

Programming

An important factor for error-free programming is proper preparation of the vehicle and observance of the instructions during programming. There are special requirements that may apply to individual vehicle models. The actions that are required for all models are described in the following pages.

Note: Programming must always be preceded by carrying out a diagnosis on the vehicle and making sure that there are no faults on the vehicle. Programming must not be started before faults in the vehicle electrical system are ruled out. Always refer to the latest bulletins and information on currently known issues involving software releases. Please refer to SI B 01 03 06 for further information.

Preparatory Measures

 <p>TEC4-4830</p>	<p>Engine</p> <p>Turn off engine, ignition key turned to terminal 0</p>
 <p>TEC4-4831</p>	<p>Manual Gearbox/SMG/DKG</p> <ul style="list-style-type: none"> - Transmission in neutral - Parking brake applied
 <p>TEC4-4832</p>	<p>Automatic Transmission</p> <ul style="list-style-type: none"> - Transmission in position P - System temperature below 80°C
 <p>TEC4-4833</p>	<p>Parking Brake</p> <p>On vehicles with electromechanical parking brake, apply the parking brake by means of the parking brake button, otherwise use the handbrake.</p>
 <p>TEC4-4834</p>	<p>Electric Loads</p> <p>All electric loads, lights and turn indicator switched off.</p> <p>Wiper/washer system switched off. Make sure that the wipers can move freely.</p> <p>The wipers may be activated during programming. On no account block the wipers.</p>

	<p>Battery and Battery Charger</p> <p>The battery should be sufficiently charged at the start of the programming procedure (>13 V).</p> <p>Connect a BMW-specified and approved battery charger and set to external power supply mode (FSV mode). Do not connect or disconnect the charger during programming. The electrical system voltage must not drop below 13 volts during the programming procedure.</p> <p>Note: If Programming/Coding a Hybrid Vehicle please follow their specific preparatory measures.</p>
	<p>Diagnosis</p> <p>Carry out a vehicle test on the ISTA workshop system.</p> <p>Using the ISTA diagnosis system, rectify any problems before programming and delete stored fault codes.</p>
	<p>Interfaces</p> <p>Programming is performed exclusively via the ICOM devices.</p> <p>Any vehicle equipped with a MOST bus manufactured before the F01/F02, will require the use of an ICOM A and an ICOM B.</p>
	<p>Programming</p> <p>CKM data is automatically saved by ISTA/P and written back to the control unit after programming.</p> <p>The data status of the ISSS must always be up to date.</p>

Hybrid Vehicles

To properly diagnose E72 Active Hybrid X6 vehicles, all current software must be installed on your ISSS & ISTA/P equipment. Please refer to the Workshop Technology website on Center Net for the update instructions contained in the "ISSS & ISTA/P Installation Manual" and for other relevant information - Release Notes, 3g DCS messages etc. The update process takes approximately 2-3 hours.

Please ensure that no overnight programming happens when the updates are scheduled.

Updated information:

- Please check that the transport / energy saving mode is off.
- All E72 Active Hybrid X6 vehicles need to be on the integration level (I-level) E070-09-12-512 or higher.

-
- Before start programming, please make sure that the **HV (High Voltage) is switched off** with Service Disconnect.
 - Keep in mind that the car has to go to sleep mode before you can start the engine after programming.
 - The E72 Active Hybrid X6 is fully supported by BMW NA Technical Services.

During Programming/encoding

- Take note of and comply with any prompts or instructions issued by ISTA/P.
- Leave the ignition on and comply with the instructions issued by ISTA/P (e.g. for CAS).
- Do not cut off the connection between the workshop network, ICOM and vehicle.
- After every action in the luggage compartment (e.g. loading / removing navigation DVD), close the luggage compartment lid of the vehicle (prevents the luggage compartment lights from overheating).
- Do not do anything in or on the vehicle during vehicle programming/encoding unless the ISTA/P system has issued an instruction to do so.

Follow-up

- The follow-up work listed at the end of the final report such as calibrations, initializations, service functions, etc. are to be carried in the vehicle test in the ISTA workshop system. Each item of follow-up work is to be confirmed individually.
- Enter time and date information in vehicle via iDrive for correct CBS value calculation.
- After vehicle programming/encoding, insert/connect all data storage media (DVD, iPod®, etc.) that were previously removed/disconnected in the drives and interfaces in the vehicle.
- Compare the previously printed out or noted CBS data of the control units and, if required, reset and correct them via the vehicle test in the ISTA workshop system.
- Run the vehicle test with the ISTA workshop system and terminate the vehicle test.
- For safety reasons, keep vehicle stationary for at least 5 minute (vehicle electrical system 2000 and vehicle electrical system 2020 vehicles) or 16 minutes (I-Bus vehicles) with terminal R OFF so that all control units "go to sleep", i.e. can assume rest state.

Note: Control units that do not go into "sleep mode" could cause errors relating to closed circuit current!

- Concluding check that the vehicle is trouble-free.
- Check all radio and TV frequencies and destinations previously noted and store manually as necessary.

Programming of Control Units

The programming system ISTA/P ensures updating of the data statuses on all vehicles by automatically generating a measures plan that should be implemented on vehicles that are bound to an I-level status.

In this context, a distinction is made between three different options. Each of these options represents a change or adaptation to the software and functions. A distinction is made between three measures:

- Programming
- Coding
- Customizing

Programming

Programming (also known as flash programming) loads a new program or data in the control unit. A distinction can be made between control units with:

- Program status and
- Program and data status

The program status of the control unit corresponds to the operating system and controls the computer program in the control unit. The data status involves the characteristic maps and characteristic curves specific to the vehicle, engine and transmission. The ISTA/P programming application automatically takes that into account when programming the control unit concerned.

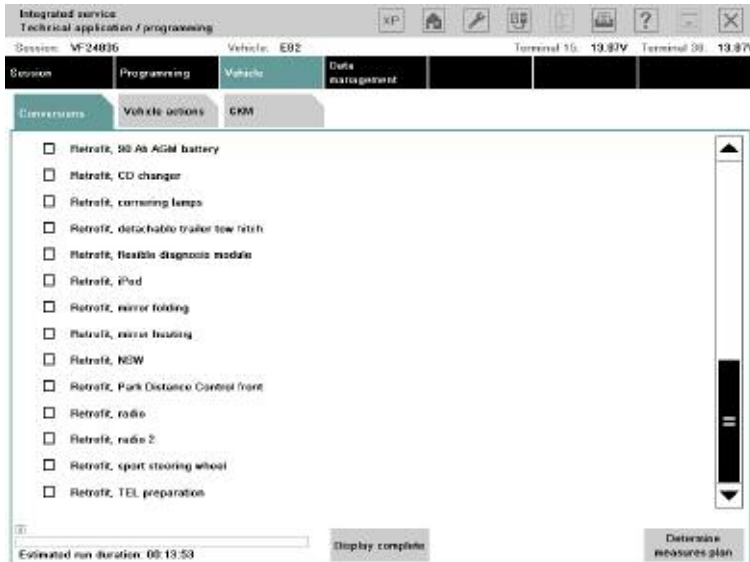
With ISTA/P, the control unit has been programmed, any necessary coding procedures are performed automatically.

Coding

Coding involves adapting the control units to the specific vehicle. That means that functions and data maps already in the control modules are enabled or activated in accordance with the vehicle order for the vehicle.

Customizing

On older vehicles, the car and key memory (CKM) option located under the Vehicle option is used to enter the customer-specific settings for the car and key memory functions on certain electrical systems.



Personal Profile

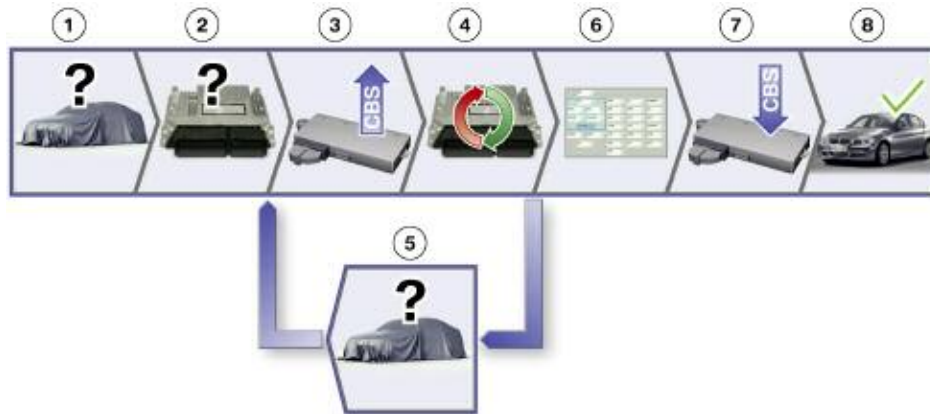
On vehicles with the Personal Profile function, the customization settings are entered directly by the customer. For such vehicles, there is no Customize button on the Vehicle menu.

Programming Process

The programming process consists of various procedures, some of which require manual intervention although most are automatic.

The individual procedures are illustrated here and described in detail below.

Programming process sequence



Index	Explanation
1	Identify vehicle and obtain read-out of control unit data
2	Produce and configure measures plan
3	Prepare for programming, export CBS/CKM data
4	Carry out repairs and replace control units where necessary
5	Re-check vehicle identification after repairs. Update measures plan
6	Carry out programming
7	Carry out programming follow-up, import CBS/CKM data
8	Programming successfully completed

Starting Programming

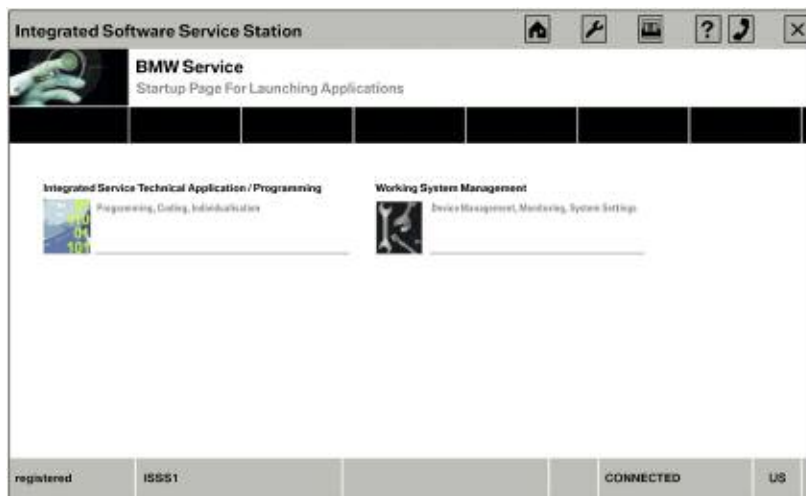
Essentially, ISTA/P is an independent external application that will run on the ISSS in Phase 1.

Although in a latter stage ISTA/P can be started from the ISID, it is entirely independent of the ISTA diagnosis application. That means that before programming can be started, diagnosis must be ended or interrupted.

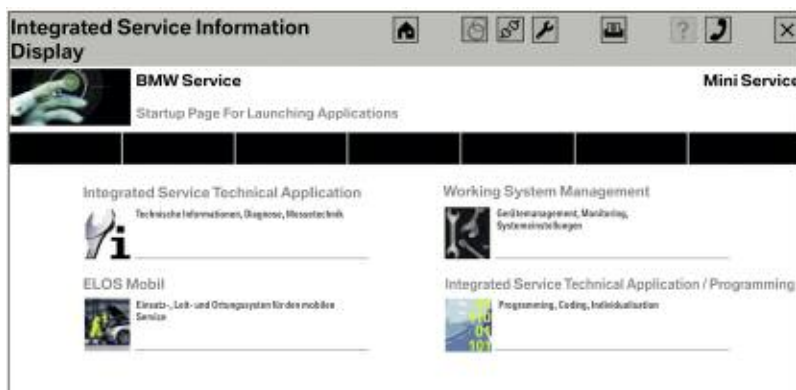
Starting and management of a new programming session can only be carried out by means of ISTA/P.

When ISTA/P is started, the user has a choice of three different actions:

- Cancel and exit ISTA/P
- Open an existing programming session
- Start a new programming session



Start screen on the ISSS Integrated Software Service Station



Start screen for ISID (not enabled initially)

Opening an Existing Programming Session

If the user decides to open an existing programming session, all the programming sessions currently in progress are listed and the user can select the session required.

On the toolbar there are various buttons for opening more menus.

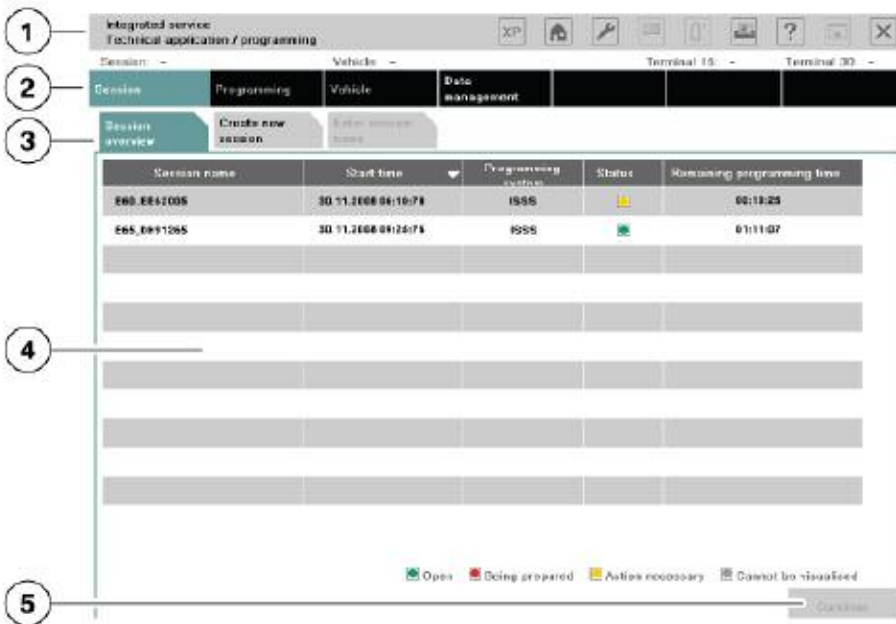
On the options bar, you can select the session or the vehicle that is to be programmed or the Integrated Software Service Station (ISSS) that is to be used for programming. Depending on the model of the vehicle, each ISSS can carry out up to five programming sessions at the same time.

The button for selecting the vehicle access method is located on the function bar.

The information panel shows the details of the sessions or available ICOMs.

The control buttons are used to navigate through the programming process, e.g. the "Next" button takes you to the next screen.

List of current sessions

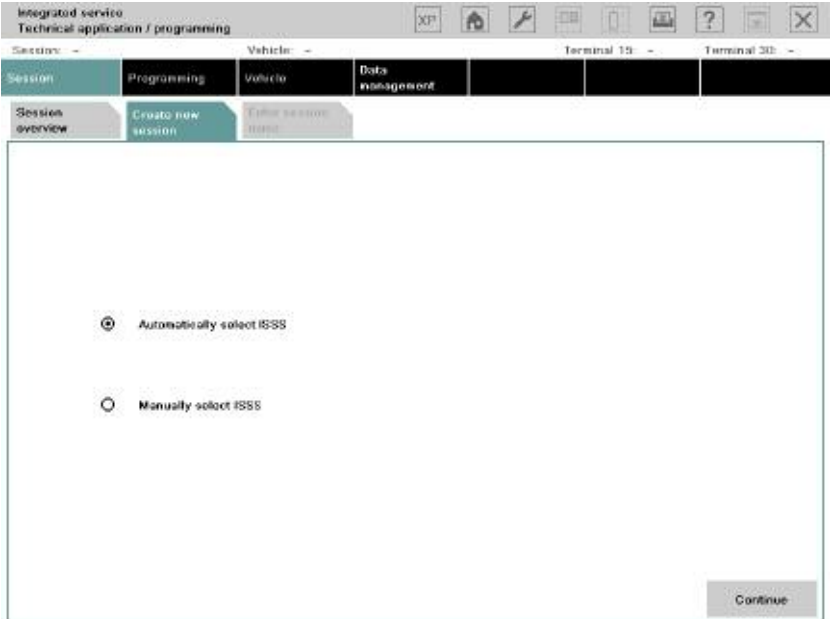


Index	Explanation
1	Toolbar
2	Options bar
3	Function bar
4	Information pane
5	Control buttons

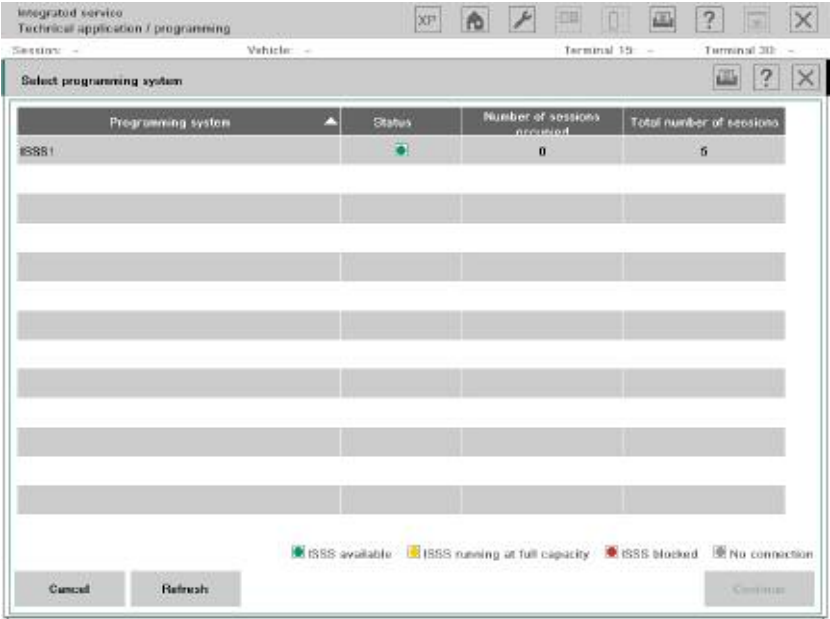
Starting a New Programming Session

When a new programming session is to be started, the programming server on which the vehicle is to be programmed must first be selected.

The ISSS used for the session can be selected manually or automatically. Because at the moment the ISSS can only program one F01 at a time or 5 other vehicles at a time, it is recommended that the automatic ISSS selection is carried out.

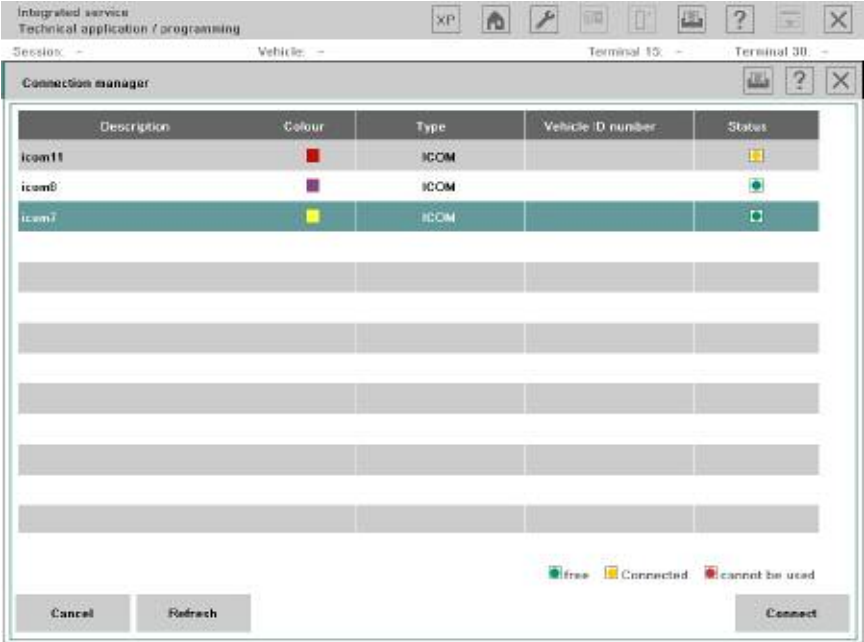


Selecting ISSS to be used for session



Selecting ISSS to be used for session

The connection manager on the ISIS establishes all the ICOMs that are available and displays the details. The user can select the desired ICOM or vehicle from the list displayed. ISTA/P then establishes the vehicle data. If that is not possible for any reason, the vehicle must be selected manually.



Selecting ICOM

The user then has the opportunity to give the session any individual name, but the system automatically enters the model of the vehicle along with the chassis number as an identifier (example: E60_EE12345).

Selecting Vehicle Interface

The same vehicle interfaces are used for programming with the new workshop system as for diagnosis.

From the F01 on, all control units can be programmed using only the **ICOM A**. Even though the F01/F02 is equipped with a MOST bus, **ICOM B** is not necessary due to the ethernet connection via the OBD2 connector.

For CAN-bus vehicles the ICOM A is used. MOST control units are programmed directly using the ICOM B. The ICOM B is connected to the ICOM A and the workshop network by a USB cable.

For older I-bus/K-bus vehicles with the round diagnosis connector, the ICOM C is used in conjunction with the ICOM A.



Vehicle interfaces

Vehicle Access for MOST Bus

When programming vehicles with MOST bus from E65 to E9X, vehicle access is established as shown in the photograph below.



Vehicle access for programming MOST-bus. The location of the MOST connector varies according to the vehicle.

Vehicle Access for I-bus/K-bus Vehicles

On older vehicles without OBD II connection, programming is carried out via the round diagnosis connector in the engine compartment. That requires connecting the ICOM C to the ICOM A and on to the workshop network.



Vehicle access for I-bus/K-bus vehicles

Vehicle Access from the F01/F02 on

All control units will be programmed exclusively using the ICOM A.

Identifying the vehicle and obtaining a read-out of control unit data

ISTA/P checks the vehicle electrical system, the central gateway and the vehicle-order control units (FRM/CAS/light module). The vehicle order (VO) is read and a consistency check carried out between the actual status and the required status.

If the central gateway does not respond, a software routine for restoring it to working order is attempted before the service technician is instructed to replace the ZGW.

First of all, the basic details of the vehicle are established such as VIN number, model, type code, etc.

Then, all control units fitted and the current I-level of the vehicle is determined. In addition, the programming system establishes, if possible, the software version last used to carry out servicing operations on the vehicle.

That makes it possible to avoid unnecessary programming if the vehicle already has the latest software version.

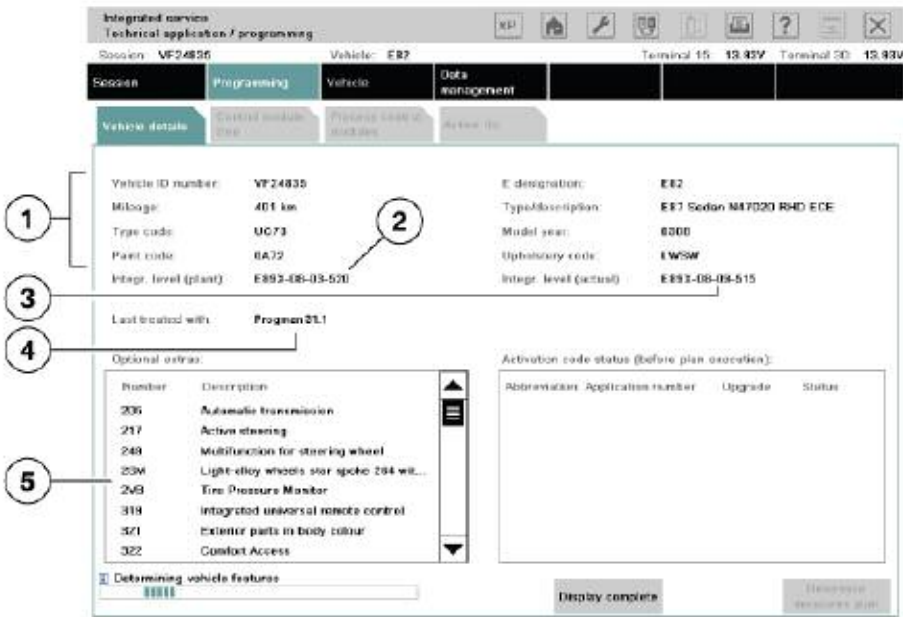
Afterwards, the details of the ex-works equipment options for the vehicle stored on the BMW programming system are retrieved.

Next, the control units identified and the equipment options fitted are compared (comparison of required vs. actual status).

For example, it is established whether the list of control units obtained actually matches those fitted on the vehicle and whether the level matches the current required status.

That ensures that all control units on the vehicle communicate properly with one another within the network. An I-level is a combination of networked control units validated and approved by BMW Development.

Establishing vehicle details

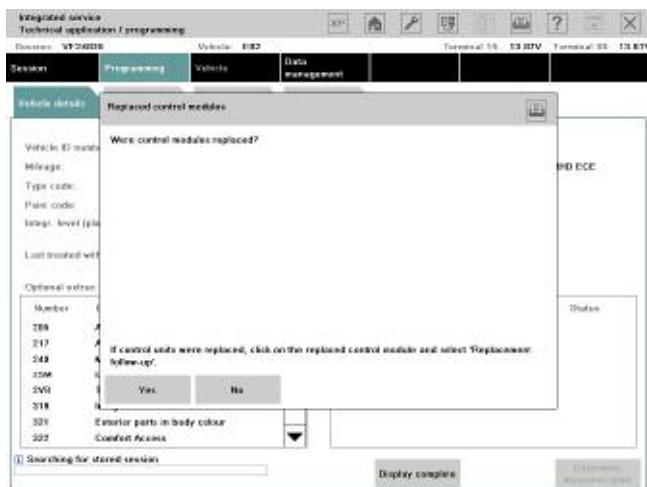


Index	Explanation
1	Vehicle data
2	I-level with which the vehicle left the factory
3	Current I-level of the vehicle
4	System and version last used to program the vehicle
5	List of all optional equipment fitted on the vehicle

Producing and Configuring the Measures Plan

Before programming can be carried out, the measures plan is produced and can also be configured by the user. For example, it is now possible to program retrofits or conversions at the same time as the software update. The configuration for that is done now so that no further manual input is required later on during the programming sequence and it can then run automatically.

After the identification process, the user is asked if any control units have been replaced on the vehicle. If the answer is YES, ISTA/P checks whether an enabling code is required for the replaced control unit and, if so, requests it from the user if it has not already been entered on the system.



Control unit replacement check

Associated customization data such as settings for the air conditioning are backed up and the action "Follow up control unit replacement" added to the list of actions.

In general it is advisable to manually back up the customer's individual settings. If the control unit is defective, they can not be read and, therefore, can not be written back to the control unit after programming either.

The necessary actions, such as "Update control unit software", are established and added to the list of actions.

Then for the first time ISTA/P produces a measures plan based on the tasks in the list of actions at that point.

The user has the option of editing the measures plan. The user can add further actions to the measures plan but not remove them. The following actions can be added to the measures plan:

- Carry out conversion
- Prepare control unit replacement
- Program control unit
- Code control unit
- Set CKM data
- Enter enabling code
- Import vehicle order

The screenshot shows the 'Integrated service' window with the 'Vehicle' tab selected. The 'Actions list' sub-tab is active, displaying a table of vehicle modules. The table has columns for 'Status', 'Scan name', 'Description', 'Programming', 'Encoding', and 'Replacement'. Each row represents a different vehicle system with checkboxes indicating the status of these actions.

Status	Scan name	Description	Programming	Encoding	Replacement
	JBC	Junction Box electronics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	MHS	Multiple restraint system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DMC/DGE	Digital Motor Electronics/Digital Diesel Elect...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	AL	Active steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ESP	Regulated fuel pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	EGS/SHD	Transmission control/sequential manual tran...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	REC	Tire pressure control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CA	Comfort Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DSC	Dynamic Stability Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	TEL/ULP	Telephone / Universal charging unit/handle...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	AMP	Amplifier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DCC-ASR	DCC audio system controller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	EAS	Car Access System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

At the bottom of the window, there is a status bar with the text 'Estimated run duration: 00:13:53' and four buttons: 'Display complete', 'Retrieve measures', 'Select complete encoding', and 'Delete measures plan'.

Note: Required service functions such as initializations and clearing of fault codes are only indicated; they must be carried out on the ISTA diagnosis system.



Display of action plan as graphical chart



Measures plan shown as a table

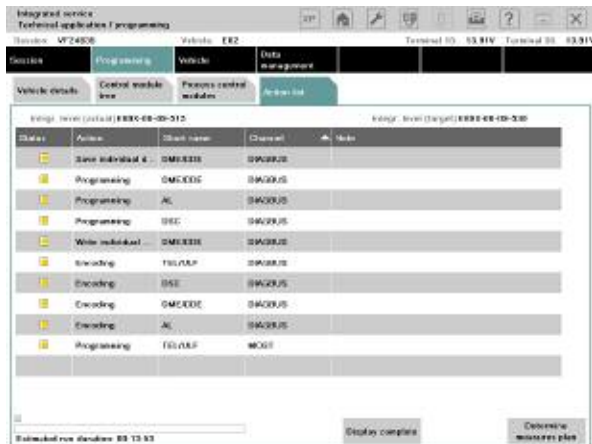
The measures plan can be viewed as a graphical chart by pressing the button "Control unit tree" or as a table by pressing the button "Edit control units".

The measures plan can now be confirmed, rejected or cancelled.

The measures plan indicates which control units do not require any action - they are marked green.

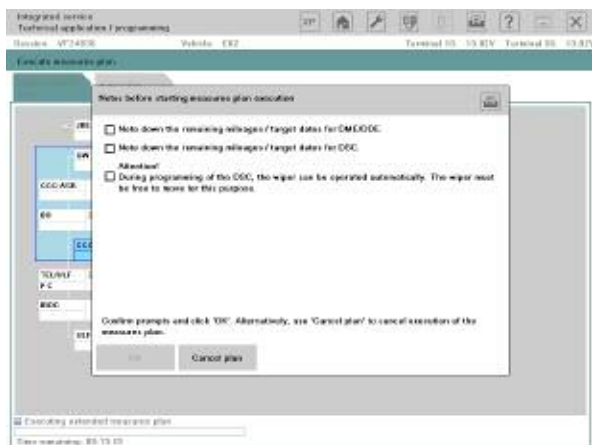
The other control units, on which action is required, are marked yellow or red. The actions that are required are indicated by the letter(s) shown on the control unit. The letters stand for the following:

- P** = Program
- C** = Code
- I** = Initialize
- R** = Replace
- M** = Mount (i.e. fit/install)
- U** = Unmount (i.e. remove).



Action list

The Action list contains all information relating to the concerned control unit and which via channel (D-CAN/MOST) it is programmed.



Guidance notes

Furthermore, additional guidance notes can be shown, e.g. on noting the remaining life of DME or conversion instructions for replacing control units.

Note: The guidance notes must be acknowledged by ticking the checkboxes and confirmed by clicking OK.

Preparing for Programming

After confirming the measures plan, the flash programmability of the control units is first checked and a notification message displayed if there is a problem. Then the customization data and the CBS data is read and backed up for rewriting later on.

If a control unit requires replacing, ISTA/P displays a message to the user indicating that the control unit should now be replaced.

After replacement is confirmed, the action "Follow up control unit replacement" is flagged for attention later on in the process.

ISTA/P then shows all required notifications, which must be acknowledged by the user before the actual programming starts.

That simultaneously starts the automatic programming process which requires no further interaction on the part of the user.

Note: As always, please keep in mind that the CAS is programmed first with the key removed. After successfully programmed, the ignition has to be switched on again.

Carrying Out Repair Tasks

If it was established in the process of identifying the vehicle that repair tasks are required, e.g. due to updating hardware or replacing a control unit, they are now carried out before the actual programming/coding process.

If the spare part is not available or the wrong part has been ordered, the session can be saved and ended at this point. As soon as the right part is available, the session can be retrieved and continued.

ISTA/P establishes from the measures plan which repair tasks are required and displays them. After successful completion of a repair task, the vehicle must be re-identified and any necessary software updates added to the measures plan.

In that way the possibility of inconsistencies on the vehicle after a repair is avoided. If a repair task fails, the programming process is cancelled.

Updating the Measures Plan

After a repair task has been carried out, ISTA/P performs the vehicle identification process again. If it identifies irregularities, e.g. that a control unit with an older I-level status has been fitted, appropriate actions are automatically set on the system or indicated to the user.

If there are irregularities, ISTA/P establishes which software updates are required based on compatibility management and adds them to the action plan. The measures plan is then updated and programming automatically started.

To prevent vehicles with inconsistencies being created, the user has no means of stopping the programming sequence.

Carrying Out Programming

This stage of the process involves the programming and subsequent coding of the control units.

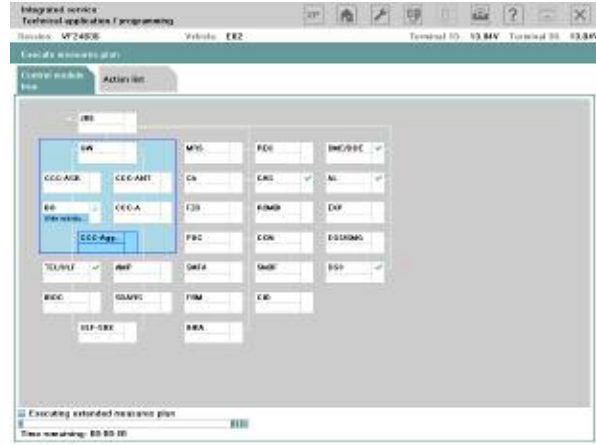
In the process of programming or coding a particular control unit, the system checks in each case whether the operation has succeeded before continuing with the programming of further control units. A particular version of ISTA/P distributes only one I-level. Programming of the vehicle as a whole (meaning all control units on the vehicle) is always performed to the latest I-level (target I-level).

The next step is to write the enabling codes to the relevant control units if required and modifying the vehicle order if conversions have been carried out. The programming of control units can also be performed simultaneously if they are on different bus systems, e.g. MOST and CAN.

The progress of the programming process is indicated by a progress bar.



Carrying out programming



View after completion of programming

If programming/coding/initialization has been completed successfully, there is a green tick by every control unit on which an action has been performed.

If an action has failed or not been completed, the control unit concerned is marked with a red X.

By clicking the control unit concerned, you can obtain information as to why programming failed.



Completing Programming Session

The last stage of the programming process is importing the customization, CBS and CKM data. The data is written back to the control units and checked. Afterwards, the automated initialization sequences are performed where required (electric windows/slide/tilt sunroof).

The automatic programming process is then complete. The initialization sequences that require user interaction are then carried out.



Notes on follow-up

After completion of the initialization sequences, ISTA/P establishes from the measures plan what service functions are required, e.g. setting steering angle. They are shown to the user. They have to be carried out as part of the diagnosis after programming. That is carried out by way of the vehicle test on the ISTA workshop system and afterwards all fault memories must be cleared.

Finally, the actual status is checked once again and the final report produced. ISTA/P provides the user with the final report.

The user can print out the final report or else it is stored for a certain period on the ISIS.

The entire programming log is sent to BMW AG as part of the FASTA data. This allows BMW to retrace how the vehicle programming was carried out from the user actions, either for accounting purposes or if there is a subsequent fault.

Furthermore, that data is automatically analysed so that software errors can be detected at an early stage and suitable measures initiated. As a result, BMW is able to continuously monitor and improve software quality.

Final Report

1 Final report

Session name: ESE_VF21628
 Total duration: 00:28:13
 Concluding work notes: present (see below)
 Change vehicle order: No

Header data

2 Date: 11/16/2016 Time: 11:12:00 AM ESTAP version: 31.24.8

3 Model entry: 600 Type/development: UCTD / 507 Sedan / H7C00 / RND 50E

4 Mileage: 431 Vehicle ID number: WSAUCT3875F21628

5 Integration level (plant): Integration level (site): Integration level (pack):
 030N-09-05-030 030N-09-05-015 030N-09-05-030

6 Production date: 0300 Part number: 3470 Updatable code: LACW

E words: 0300

K words:

7 SA numbers: 236 217 240 208 210 216 221 332 347 403 400 401 441 462 460 468 473 481 488
 494 492 494 502 507 521 522 524 524 540 562 570 504 600 622 625 645 652 656
 677 694 692 693 8181 104 100 134 302 360 360 400 423 476 502

8 Programmings sequential OBU (K line, DCMN)

*Real coding according to execution sequence

Control module	Action	Result / fault code	Status	Type	Hardware index	CM part number	New part number
CS	Programming	Successful	✓	SW	04	-	0147227
DMS DDE	Programming	Successful	✓	Sys	00	7994021	7995870
AL	Programming	Successful	✓	Sys	03	0791167	0791801
DSC	Programming	Successful	✓	Sys	02	0791786	0791824

9 Programms control MOST

*Real coding according to execution sequence

Control module	Action	Result / fault code	Status	Type	Hardware index	CM part number	New part number
TRUSLP	Programming	Successful	✓	Sys	18	9199718	9201629

10 Encodings

*Real coding according to execution sequence

Control module	Action	Result / fault code	Status	Type	Hardware index	CM part number	New part number
CS	Encoding	Successful	✓	Sys	04	-	0147227
TRUSLP	Encoding	Successful	✓	Sys	18	9199718	9201629
DSC	Encoding	Successful	✓	Sys	02	0791786	0791824
DMS DDE	Encoding	Successful	✓	Sys	00	7994021	7995870
AL	Encoding	Successful	✓	Sys	03	0791167	0791801

11 Data recovery

Control module	Action	Result	Status	Type
DMS DDE	Save individual data	Successful	✓	Sys
DO	Save individual data	Successful	✓	Sys
DMS DDE	Write individual data	Successful	✓	Sys
DO	Write individual data	Successful	✓	Sys

12 Additional actions

Control module	Action	Result / fault code	Status
-	Vehicle order alignment	Successful	✓
-	Update integration level	Successful	✓

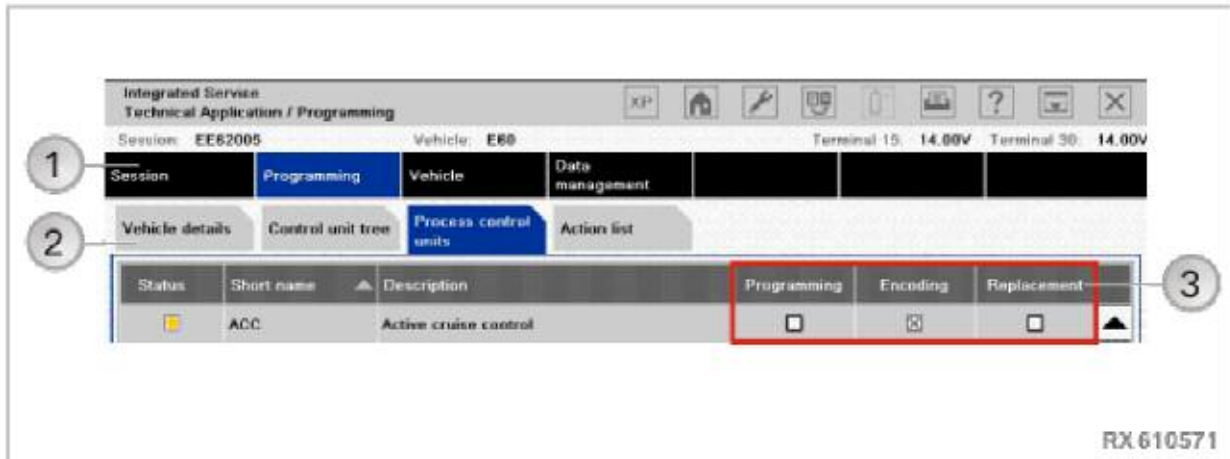
Concluding work notes

11 Number Activity / note
 1. - [Report] / After completion of programming / encoding, reset the adaptation values of the DMS/DOE via the vehicle test in the ISTA software system. Compare remaining mileage / target data in DMS/DOE with the information data. If successful, local and corrected remaining mileage / target data.
 2. - [Report] / After completion of programming / encoding, commission / adjust the AL via the vehicle test in the ISTA software system.

Index	Explanation
1	Final report
2	Current programming data: data, time, ISTA/P version
3	Vehicle data: mileage and VIN number
4	I-levels: factory, last, current
5	SA numbers
6	Programming actions indicating success or failure over MOST
7	Programming actions indicating success or failure over I/K bus
8	Coding actions indicating success or failure
9	Data saving actions indicating success or failure
10	Additional actions, e.g. whether updating of I-levels was successful or failed.
11	End notes

Overview of Functions on ISTA/P

The following graphic in the "Programming" menu, "Edit control units" tab, shows a layout example of a typical screen mask.



Index	Screen element	Index	Screen element
1	Menu	3	Functions
2	Tab		

Overview of Main Functions

The functions in ISTA/P can be accessed via certain paths. The following overviews show the menu in which the required function can be executed. Manual selections and information are normally not shown.

Menu	Session Is displayed after "Start ISTA/P"		
Tab	Session Overview	Create New Session	Enter Session name
Function	Programming sessions that are running are displayed	Select ISSS automatically/manually Select programming system Control unit information Connection manager Select vehicle/interface, transfer to the Programming menu	Issue session name

Menu	Programming Is displayed after "Start ISTA/P" (manual switch to "Vehicle" menu and "Data management" menu possible)		
Tab	Vehicle details	Control unit tree	Action List
Function	Display of vehicle details Determine action plan, transfer to "Action Plan" menu	Control unit actions (programming, encoding, replacing, replacement follow-up) Action list (after control unit action) Control unit information Overall encoding Determine action plan, transfer to the Display action plan menu	Planned actions are shown Determine action plan, display transfer to "Action Plan" menu

Menu	Vehicle Is displayed after "Create new session"		
Tab	Conversions	CKM	Vehicle actions
Function	Retrofits Conversions	Car and key memory settings	Updating of map data, navigation system (HDD update) Enabling of map data for navigation system Update Gracernote® DB Import vehicle order Select complete encoding

Menu	Data management Is displayed after "Start ISTA/P" and after "Create new session"		
Tab	Import/delete enabling code (summarized)	Import/delete vehicle order (summarized)	Reports
Function	Import enabling code Enter short enabling code Delete imported enabling code	Import vehicle order Delete imported vehicle order	Reports of previous sessions are shown

Menu	Display action plan (1/2) Is displayed after "Determine action plan"		
Tab	Action plan	Control Unit Tree	Action List
Function	Action plan is shown	Planned actions are shown Action List Control Unit Information Accept action plan, action plan is executed	Planned actions are shown Accept action plan, action plan is executed

Menu	Display action plan (2/2) Is displayed after "Determine action plan"		
Tab	Order list	Activation code list	
Function	Control units to be replaced are shown together with the order number	Imported enabling codes are shown	

Menu	Action plan execution complete Is displayed after "Accept action plan"		
Tab	Final Report	Control Unit Tree	Action List
Function	Final report is shown End programming switch to Session menu	Executed actions are shown Action List Control Unit Information End programming switch to Session menu	Executed actions are shown End programming switch to Session menu

Import Vehicle Order (VO)

In order to import the VO of a vehicle, you should go to the Data Management Menu and then click the Import vehicle order tab.

The following data is necessary to generate the vehicle order:

- Which conversions/retrofits are to be carried out, or which fault has occurred;
- 7-character vehicle identification number;
- Dealer number.

Note: The vehicle order for conversions and retrofits is ordered through the ASAP portal. To eliminate errors, the vehicle order can be ordered through the subsidiary or the regional office.

The vehicle order is downloaded in the form of a compressed XML-file (ZIP file). The ZIP file must be unpacked and filed on the root directory of the data carrier (e.g. F:\)

The diversity of USB storage media on the market means that it can not be guaranteed that every USB data storage medium will work with ISTA/P.

All the vehicle identification numbers where the vehicle orders are in the data stock of ISTA/P are displayed in a selection list. The user can select a vehicle identification number and have the corresponding vehicle order displayed. The user can also search for a vehicle identification number by changing the sorting function.

User action	Result
1. Select "Import vehicle order" tab.	The vehicle identification numbers for which vehicle orders or central encoding keys are available are displayed.
2. Press the "Import" button to acknowledge.	A prompt to insert the data carrier appears.
3. Insert a data medium in ISSS or set up a connection between ISSS and the USB data storage medium. 4. Select vehicle order. 5. Press the "OK" button to acknowledge.	The vehicle order is imported.

How to Import a VO?

Prerequisites:

- Vehicle Order (VO) as XML file received via PuMA case or email, e.g., FZ38042.xml
- Media to copy the XML file on:
 - USB stick (recommended)
 - CD-ROM media and CD/DVD burner
 - Floppy disc
- IBAC code provided by RTE/NTE via PuMA case or email,
e.g., 3R4SMT4NRI65QBI

Note: 1. When using a USB stick, ensure it's formatted as a removable disc (usually default format). Otherwise the stick will not be recognized by ISTA/P.

2. More than one VO can be loaded on the interchangeable data media. VOs then need to be separated by different file names.

3. Recommended filename is: [7-digit VIN].xml

4. Currently the import of a VO is protected by IBAC. Make sure you have the 15 digit IBAC code before you connect the vehicle.

ISTA/P – How to import a vehicle order (VO)

Integrated service
Technical application / programming

Session: -- Vehicle: -- Terminal 15: -- Terminal 30: --

Services: Programming Vehicle **Data management**

Session overview Create new session Delete session

Session name	Start time	Programming status	Status	Remaining programming time

Select *Data management* on the ISTA/P start screen.

Open Being prepared Action necessary Cannot be visualised

Continue

1

ISTA/P – How to import a vehicle order (VO)

Integrated service
Technical application / programming

Session: -- Vehicle: -- Terminal 15: -- Terminal 30: --

Services: Programming Vehicle **Data management**

Import activation code Delete activation code **Import vehicle order** Delete vehicle order Reports

Vehicle ID number

- CR63207
- DT32832
- LX04305
-
-
-
-
-
-

already stored vehicle orders

File Number of bits

File Import

1 2

1

2

ISTA/P – How to import a vehicle order (VO)

The screenshot shows the ISTA/P software interface. At the top, there is a menu bar with 'Session', 'Programming', 'Vehicle', and 'Data management'. Below this, there are buttons for 'Import activation code', 'Delete activation code', 'Import vehicle order', 'Delete vehicle order', and 'Reports'. The 'Import vehicle order' and 'Delete vehicle order' buttons are highlighted with red boxes and numbered 2 and 1 respectively. Below the menu bar, there is a list of vehicle IDs: '0460757', 'D132632', 'F230642', and 'L304389'. The 'F230642' entry is highlighted with a blue box and labeled 'imported vehicle order'. At the bottom of the interface, there is a 'Filter' section and a 'Number of hits' section. A large green arrow at the bottom contains the numbers 1 through 5.

1 Select *Delete vehicle order*.
2 Select *Import vehicle order*.

1 2 3 4 5

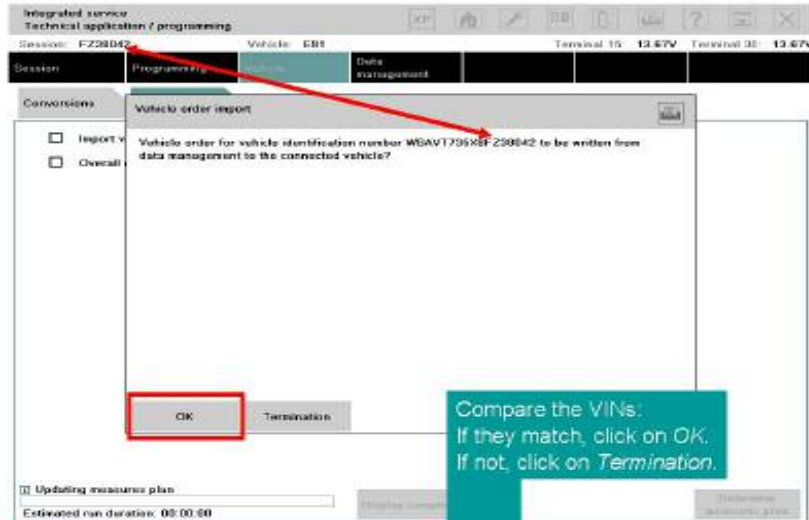
ISTA/P – How to import a vehicle order (VO)

The screenshot shows the ISTA/P software interface. At the top, there is a menu bar with 'Session', 'Programming', 'Vehicle', and 'Data management'. Below this, there is a 'Conversion' section with a 'Vehicle actions' sub-section. The 'Import vehicle order' checkbox is highlighted with a red box and numbered 2. The 'Overall encoding' checkbox is also visible. At the bottom of the interface, there is an 'Estimated run duration' section and a 'Start session' button. A large green arrow at the bottom contains the numbers 1 through 6.

Start a session with the vehicle to which you want to write the imported VO.
After complete identification:
1 Select *Vehicle*.
2 Check out *Import vehicle order*.

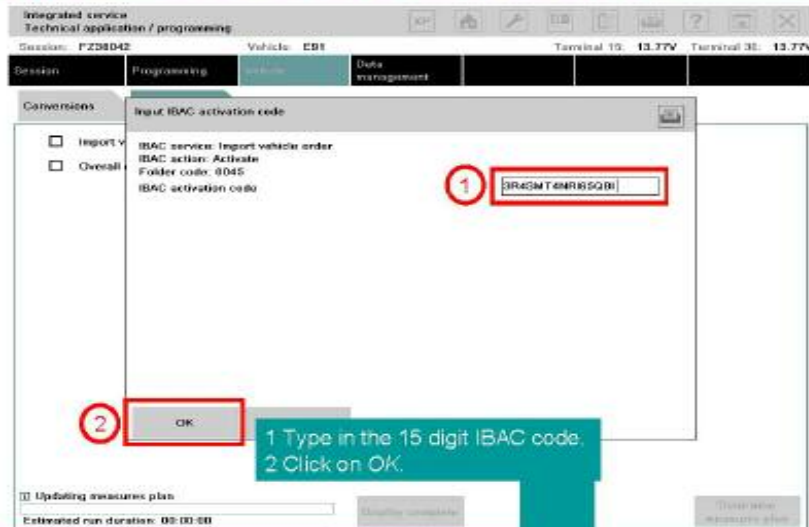
1 2 3 4 5 6

ISTA/P – How to import a vehicle order (VO)



1 2 3 4 5 6 7

ISTA/P – How to import a vehicle order (VO)



1 2 3 4 5 6 7 8

ISTA/P – How to import a vehicle order (VO)

Integrated service
Technical application / programming
Session: F238942 Vehicle: ED1 Terminal ID: 13.87V Terminal ID: 13.87V

Services: Programming Vehicle Data management

Conversions: Confirmation IBAC activation code

Import v
 Overall

Is the input: 'SR4SMT4NRH50B1' correct?

If so, confirm input with 'OK', otherwise the input can be repeated after selection of 'Back'.

OK Back

Confirm that the IBAC code is correct with OK, or go Back to reenter the code.

Updating measure plan
Estimated run duration: 00:00:00

1 2 3 4 5 6 7 8 9

ISTA/P – How to import a vehicle order (VO)

Integrated service
Technical application / programming
Session: F238942 Vehicle: ED1 Terminal ID: 13.79V Terminal ID: 13.79V

Services: Programming Vehicle Data management

Conversions: Import vehicle order successful

Import v
 Overall

Vehicle order for vehicle identification number WBAVT73509F238942 was successfully written from data management to the connected vehicle. The session will now be ended.

OK

Click on OK. The Imported VO is now written to the vehicle.

Updating measure plan
Estimated run duration: 00:00:00

1 2 3 4 5 6 7 8 9 10

Import Enabling Code

Software enabling in a number of control units (e.g. when programming the CCC, an enabling code must be imported to enable the option "extended voice control") is possible with ISTA/P.

In ISTA/P, there is the possibility to import enabling codes for a vehicle even before working through the action plan. All imported enabling codes are saved within the ISPI network and are available for future sessions without having to import them again.

User action	Result
1. Select "Import enabling code" tab.	The vehicle identification numbers for which enabling codes are available are displayed.
2. Press the "Import" button to acknowledge.	A prompt to insert the data carrier appears.
3. Insert a data medium in ISSS or set up a connection between ISSS and the USB data storage medium. 4. Press the "OK" button to acknowledge.	The enabling code is imported.

Note: The enabling code can be downloaded in the ASAP portal. The enabling code is supplied on CD with new control units.

The ZIP file must be unpacked and filed on the root directory of the data carrier (e.g. F:\).

The diversity of USB storage media on the market means that it can not be guaranteed that every USB data storage medium will work with ISTA/P.

How to Import an Enabling Code

Prerequisites:

ZIP archive file with:

- release code (FSC) file (.xml) e.g., FZ38042_00020001.xml
- certificate file (.der) e.g., FZ38042_00020001.der

Media to copy the files on:

- USB stick (recommended)
- CD-ROM media and CD/DVD burner
- Floppy disc

Note: 1. This import function neither writes the code to the vehicle nor activates the associated function in the vehicle. The activation will be requested during the measures plan realization.

2. When using a USB stick ensure, that it's formatted as a removable disc (usually default format). Otherwise the stick will not be recognized by ISTA/P.

3. The FSC file (.xml) AND the certificate file (.der) need to be extracted on the media. Do not copy the ZIP archive file on the media.

ISTA/P – How to import an enabling code (FSC)

Integrated service
Technical application / programming

Session: -- Vehicle: -- Terminal 15: -- Terminal 30: --

Services: Programming Vehicle **Data management**

Session overview Create new session

Session name	Start time	Programming device	Status	Remaining programming time

Select *Data management* on the ISTA/P start screen.

Open Being prepared Action necessary Cannot be visualised

Continue

1

ISTA/P – How to import an enabling code (FSC)

Integrated service
Technical application / programming

Session: -- Vehicle: -- Terminal 15: -- Terminal 30: --

Services: Programming Vehicle Data management

Import activation code activation Import vehicle order Delete vehicle order Reports

Vehicle ID number	Software ID	File	Certificate

File: [] Number of bits: []

Import Import

Enter short activation code

1 Select *Import activation code*.
2 Click on *Import*.

1

2

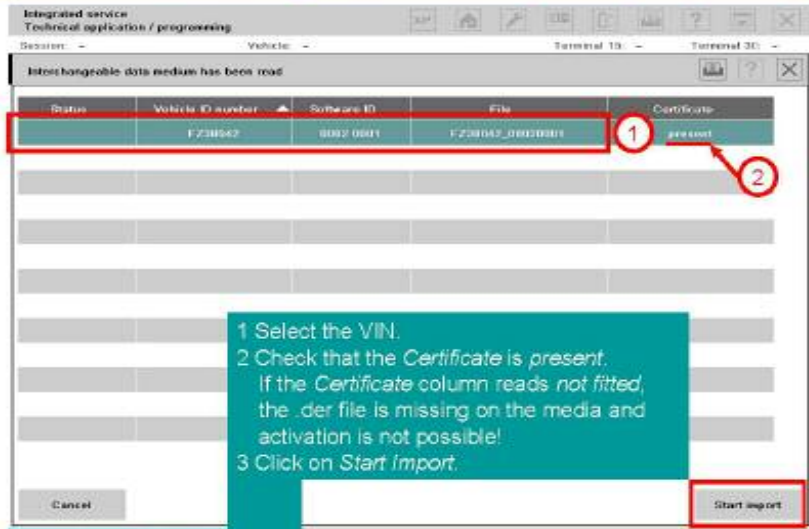
ISTA/P – How to import an enabling code (FSC)



Insert the media (e.g., USB stick) in the ISSS and click on OK.

- 1
- 2
- 3

ISTA/P – How to import an enabling code (FSC)



1 Select the VIN.
2 Check that the Certificate is present.
If the Certificate column reads not fitted, the .der file is missing on the media and activation is not possible!
3 Click on Start Import.

- 1
- 2
- 3
- 4

Updating and enabling of map data for navigation system and Gracenote® DB

Updates to map data using ISTA/P are possible only in the case of vehicles with the Car Information Computer (CIC).

Importing of a current navigation map to the vehicle becomes necessary:

- In the event of updating or initialization of the data for new, used and demonstration cars prior to delivery to customer.
- If update is requested by customer.
- In the course of a repair.

The procedure for updating the Gracenote® DB and the map data is identical. Updating of the Gracenote® DB is only possible with the Professional (SA 609) navigation system.

Enabling of the navigation map (Road Map) with ISTA/P is necessary:

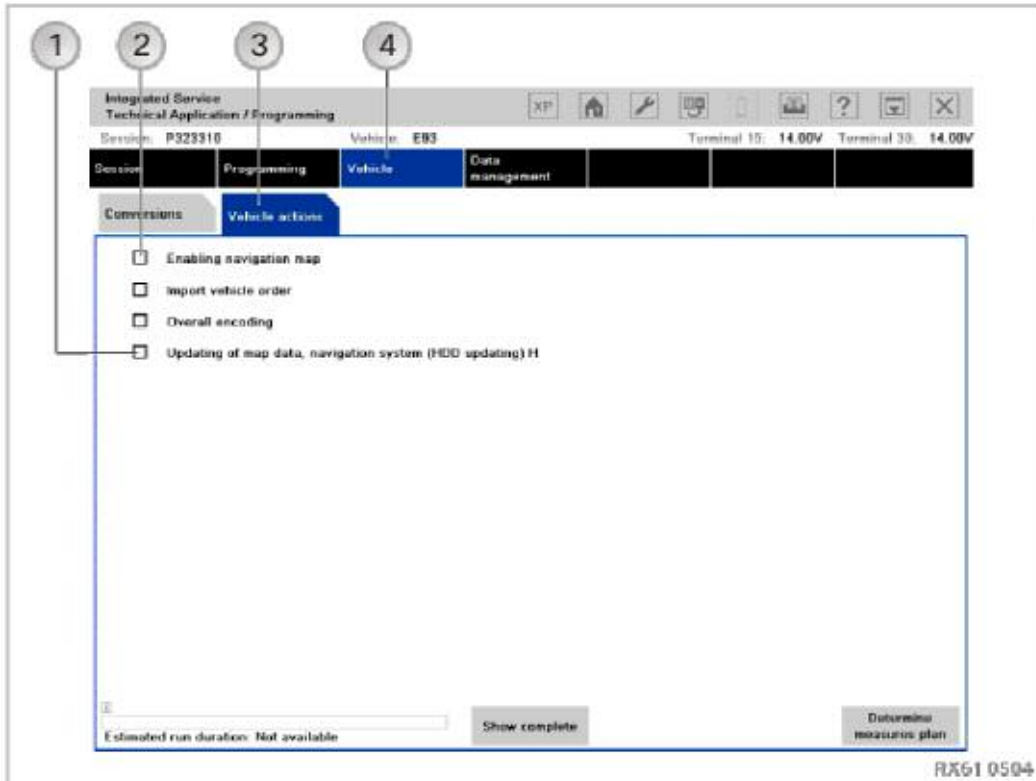
- After updating or initialization of the map data.
- In case of a repair.
- In case of retrofitting of CIC.

Note: In the course of a repair, it is not necessary to order an enabling code. In this case, the previous enabling code is used again.

Updating of the map data for the navigation system (HDD update) depends on the integration levels.

Proceed as follows to update the navigation system map data (HDD update) or Gracenote® DB:

- To create a new ISTA/P session, see "Vehicle" menu (create new session)
- Select the "Vehicle" menu
- Select the "Vehicle actions" tab



Index	Screen element	Index	Screen element
1	Checkbox "Update of the navigation system map data (HDD update)"	3	"Vehicle actions" tab
2	Activate checkbox "Enabling of navigation map (Road Map)", already imported map	4	"Vehicle" menu

- Activate checkbox "Update of the navigation system map data (HDD update)"

To select further actions with E-series (programming, encoding), switch back to the "Programming" menu.

With the F-series, all the previously selected actions will be deleted. No further actions can be added.

- Press the "Determine action plan" button to acknowledge.

The action plan is determined and displayed. The installed navigation maps (Road Maps) and Gracernote® DB are displayed on the ISIS.

Note: The ISIS server address (ISIS1 or ISIS2) on which the navigation maps with the web copy console are saved must be entered in the "Download-ISIS IP" input box. It is thus identical to the ISIS IP address, which was used by the web copy console.

The ISIS IP can be read out in the WSM under device settings.

The map data and the Gracernote® DB cannot be updated at the same time.

Ensure that the selected Road Map is installed on the ISIS.

- Enter the Download ISIS IP (e.g. 10.249.155.10) in the input box.

Select Gracernote® DB or "Road Map" by activating the corresponding checkbox

- Press the "OK" button to acknowledge

The name of the Gracernote® DB or Road Map is displayed again for checking purposes.

- Check name
- If the name is OK, press the "OK" button to acknowledge.

The action plan is drawn up.

- Accept the action plan.

After the action plan has been completed, the final report will be displayed.

Note: After the import, the map data has to be activated. An enabling code is required to do this. To activate the map data, a new ISTA/P session must be started, see next page.

Enabling is not required to import the Gracernote® DB.

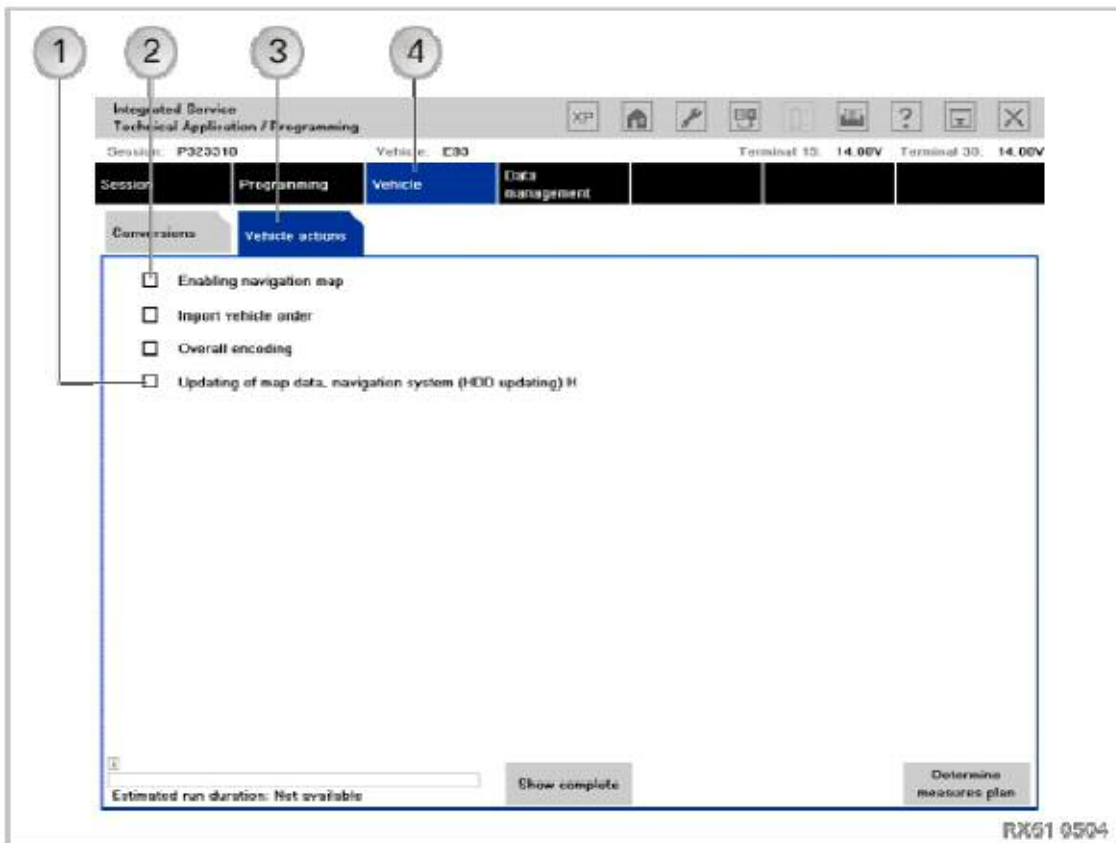
Enabling of the Navigation Map (Road Map)

An enabling code is required to enable the navigation map. When ordering the enabling code, refer to the section Data management menu.

The enabling code can be imported to the ISTA/P in the following ways:

- Import via Data management before the start of the session.
- Import via SWT online after the action plan has been accepted (as of ISPI 2.7.1).
- Import via external storage medium (e.g.: USB stick, CD) after the action plan has been accepted.

Proceed as follows to activate the map data for the navigation system:



Index	Screen element	Index	Screen element
1	Checkbox "Update of the navigation system map data (HDD update)"	3	"Vehicle actions" tab
2	Activate checkbox "Enabling of navigation map (Road Map)", already imported map	4	"Vehicle" menu

To activate a map that has already been imported (e.g. new car):

- Activate the checkbox "Enabling of navigation map".
- Press the "Determine action plan" button to acknowledge.

The remaining procedure depends on the import of the enabling code:

Import via Data Management

The required enabling code is imported from Data management. After the action plan has been completed, the final report will be displayed.

Import via SWT Online (as of ISPI 2.7.1)

The pop-up "Enabling code download via SWT" is displayed.

- Press the "Import" button to acknowledge.

The required enabling code is imported. After the action plan has been completed, the final report will be displayed.

Import via External Storage Medium (e.g.: USB stick, CD)

The pop-up "Enabling code download via SWT" is displayed.

- Press the "Next" button to acknowledge

The pop-up "Enabling code download via USB stick" is displayed.

- Press the "Import" button to acknowledge.

The required enabling code is imported. After the action plan has been completed, the final report will be displayed.

Note: For further information concerning ISTA/P please refer to the ISTA/P Documents available on the DCS.net under Workshop Technology.

Glossary

A

Assembly number

Hardware number, program version and data version together give the assembly number.

B

Bus systems

The bus systems enable the individual control units in the vehicle to be networked via serial interfaces. The following bus systems are used in BMW vehicles:

- BSD (Bit-Serial Data interface)
- Byteflight
- CAN bus (Controller Area Network bus)
- DCAN (diagnosis CAN)
- Ethernet (wire-conducted data network technology for local data networks and vehicle access)
- FCAN (suspension CAN)
- FlexRay
- K bus (body bus) (also known as I bus - instrumentation bus - in earlier models)
- K bus protocol
- KCAN (body CAN)
- K-CAN2 (body CAN 2)
- LIN bus (Local Interconnect Network bus)
- Local-CAN
- MOST bus (Media Oriented System Transport)
- PT-CAN (Powertrain CAN)
- PT-CAN2 (Powertrain CAN 2)
- USB (Universal Serial Bus).

C

CBS data

Condition Based Service. CBS data are updated in the vehicle key within a driving cycle. CBS data can be updated on the ignition key via a concealed service function.

Car and key memory

Performs customer-specific settings on the vehicle:

- Car Memory settings affect all the users of a vehicle
- Key Memory settings are user-specific and relate to a key being used.

Conversion

Modifies individual functions in a control unit (e.g. the language); the vehicle must be in sleep mode before complete conversion is carried out.

D

Diagnosis address

Address of control unit for diagnosis.

E

EWS/DME or EWS/DDE adjustment

Adjustment between EWS (electronic immobilizer) and DME/DDE control unit, control units are synchronized.

Enabling code

The enabling code generates a functional enhancement in the vehicle. Software enabling in a number of control units (e.g. when programming the CCC, an enabling code must be imported to enable the option "extended voice control). The background to this is the technology of Sweeping Technologies (SWT).

Enabling code short

Comparable to enabling code. In contrast to the enabling code, the enabling code short is not a file. It is used for manual entry purposes.

Encoding

Adapts the control units to the vehicle in which they are installed: Functions and characteristic maps are enabled or activated depending on the national-market version, vehicle equipment and vehicle type.

F

Flash-programming

See Programming

G

Gracenote® DB

Music track recognition technology from Gracenote®. It provides the data (metadata) associated with the music tracks.

This metadata contains information such as:

- Artist/performer
- Song ISTA-Programming
- Album
- Year of publication
- Genre

Gateway

This information identifies the four segment address of the component located on the network responsible for communicating from the current network to another network. If there is no address in this location then a connection to any devices outside of the current network can not be established.

I

IBAC enabling code

Enabling code for enabling conversions and retrofits.

ICOM

Integrated Communication Optical Module

The interface between the BMW Workshop network and the vehicle

IMIB

Integrated Measurement Interface Box

Measuring device for the ISTA workshop system. The IMIB is mainly operated online via the ISTA workshop system and controlled by the ISID.

ISAP

Integrated Service Access Point

Wireless data transmission device for the ITOOLS

ISID

Integrated Service Information Display

Display and operating unit for the workshop and vehicle reception

ISIS

Integrated Service Information Server (workshop server)

ISPA

Integrated Service Processes Application

Software for service reception

ISSS

Integrated Software Service Station

By installing the ISTA/P Base DVD via the SSS DVD drive, the SSS becomes an ISSS.

ISTA

Integrated Service Technical Application (diagnosis and technical documents)

ISTA/P

Integrated Service Application/Programming

(programming system)

Integration level/Integration stage

Production periods during vehicle development are denoted by integration levels (I-levels).

ITOOLS

The ITOOLS are ISID, ICOM, IMIB and ISAP

IP address

The IP address (internet protocol address) is a unique and specifically assigned address for each device in the workshop network. This address consists of a number block which is normally structured as follows.

Example: 192.168.100.10

The IP addresses must be structured so that each device in the network is distinguished from all the others and must be exclusive to that device and not shared among other devices connected to the network.

IP subnet mask

This information is used to define which segment of the four segment IP address specifically identifies the device and which identify the specific network.

Example: 255.255.255.0

Indicates that the first three segments (255.255.255) identify the specific network that the device is located on. The last segment (0) indicates that this is the segment that will identify the specific device.

Note: The network and device address information must be entered exactly as defined by the network administrator for your facility, otherwise the devices can not be accessed.

J

JETstream

Online update: Renews application software by loading new software packages.

M

MAC address

Media Access Control address is an unchangeable and unique address for identification of a network device.

Mecca indicator

The "Mecca indicator" is an arrow within the navigation system that points permanently at the geographical position of the city of Mecca.

N

Native action plan

Shown after successfully determining target context. All actions are shown that are initiated by ISTA/P (e.g. update integration stage).

Comparable to status report in Progman.

O

Overall encoding

Matches functions to each other and synchronizes them. This may be necessary if, after programming/encoding is completed, functions in the vehicle fail to work or fail to work properly.

P

Personal profile

In certain vehicles, this is the new designation for "Car & Key Memory". Settings are made directly in the vehicle. Only those settings which are difficult for the customer to grasp (e.g. tilt sensor ON/OFF) will continue to be made in ISTA/P in the Conversions menu.

Programming

Loads a new program to the control unit. Former designation "flash programming".

Programming status

Indicates the status of the control unit as a number

R

Retrofit

Designation for a subsequent installation (e.g. telephone), a new system is adapted to the vehicle's complete electrical system.

Replacement follow-up

Follow-up work on a control unit after replacement.

S

SGC

Control unit encoding

SWT

Sweeping Technology

The enabling code generates a functional enhancement in the vehicle. The background to this is the technology of Sweeping Technologies. The enabling code is encrypted in the control unit.

Software ID

Software identification feature

T

Target context

Software version of the vehicle which is allocated by the programming system.

The native action plan is shown after successfully determining target context.

U

USB

Universal Serial Bus

V

Vehicle order/central encoding code

Denotes the file in which various vehicle data (data status, optional equipment, etc.) are kept.

W

Web copy console

Web copy console for navigation data

The web copy console for navigation data allows you to copy navigation maps for the CIC onto the ISIS hard disks.

WSM

Workshop System Management

Used to manage the ISIS. All administrative tasks are executed here.

Z

ZCS

Central encoding key, see vehicle order.

NOTES

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